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Soggetti	Amorphous substances Complex fluids Chemistry, Physical and theoretical Materials science Materials—Surfaces Thin films Soft and Granular Matter, Complex Fluids and Microfluidics Physical Chemistry Characterization and Evaluation of Materials Surfaces and Interfaces, Thin Films
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Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Preparation and Characterization of Colloidal Crystals for Synchrotron and Free Electron Laser X-ray Studies -- Double Hexagonal Close Packed Structure Revealed in a Single Colloidal Crystal Grain by Bragg Rod Analysis -- Inducing Defects in Colloidal Crystals with Thermosensitive PNIPAM Particles -- Preparation and Characterization of Colloidal Cubes -- Self-Assembly of Colloidal Cubes via Vertical Deposition -- Experimental Evidence of Optimal Packings in Convectively Assembled Crystals of Colloidal Cubes -- Self-assembly of Colloidal Cubes Induced by Sedimentation -- Sedimentary Crystals of Magnetic Colloidal Hematite Cubes and the Influence of an External Magnetic Field.
Sommario/riassunto	This thesis presents an in-depth study on the effect of colloidal particle

shape and formation mechanism on self-organization and the final crystal symmetries that can be achieved. It demonstrates how state-of-the-art X-ray diffraction techniques can be used to produce detailed characterizations of colloidal crystal structures prepared using different self-assembly techniques, and how smart systems can be used to investigate defect formation and diffusion in-situ. One of the most remarkable phenomena exhibited by concentrated suspensions of colloidal particles is the spontaneous self-organization into structures with long-range spatial and/or orientational orders. The study also reveals the subtle structural variations that arise by changing the particle shape from spherical to that of a rounded cube. In particular, the roundness of the cube corners, when combined with the self-organization pathway, convective assembly or sedimentation, was shown to influence the final crystal symmetries.

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